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RAW SEQUENCE LISTING

PATENT APPLICATION: US/10/005,306

DATE: 05/31/2002

TIME: 11:52:51

Input Set : A:\P1042C1.txt

Output Set: N:\CRF3\05312002\J005306.raw

3 <110> APPLICANT: Lazarus, Robert A.
 4 Pan, Clark Qun
 6 <120> TITLE OF INVENTION: HUMAN ENASE I HYPEREFFECTIVE VARIANTS
 8 <130> FILE REFERENCE: P1042C1
 10 <140> CURRENT APPLICATION NUMBER: US 10/005,306
C--> 11 <141> CURRENT FILING DATE: 2002-05-21
 13 <150> PRIOR APPLICATION NUMBER: US 08/663,831
 14 <151> PRIOR FILING DATE: 1996-06-14
 16 <160> NUMBER OF SEQ ID NOS: 17
 18 <210> SEQ ID NO: 1
 19 <211> LENGTH: 260
 20 <212> TYPE: PR1
 21 <213> ORGANISM: Homo sapiens
 23 <400> SEQUENCE: 1
 24 Leu Lys Ile Ala Ala Phe Asn Ile Gln Thr Phe Gly Glu Thr Lys
 25 1 5 10 15
 27 Met Ser Asn Ala Thr Leu Val Ser Tyr Ile Val Gln Ile Leu Ser
 28 20 25 30
 30 Arg Tyr Asp Ile Ala Leu Val Gln Ile Val Arg Asp Ser His Leu
 31 35 40 45
 33 Thr Ala Val Gly Lys Leu Leu Asp Asn Leu Asn Gln Asp Ala Pro
 34 50 55 60
 36 Asp Thr Tyr His Tyr Val Val Ser Gln Pro Leu Gly Arg Asn Ser
 37 65 70 75
 39 Tyr Lys Glu Arg Tyr Leu Phe Val Tyr Arg Pro Asp Gln Val Ser
 40 80 85 90
 42 Ala Val Asp Ser Tyr Tyr Tyr Asp Asp Gly Cys Glu Pro Lys Gly
 43 95 100 105
 45 Asn Asp Thr Phe Asn Arg Glu Pro Ala Ile Val Arg Ile Phe Ser
 46 110 115 120
 48 Arg Phe Thr Glu Val Arg Glu Phe Ala Ile Val Pro Leu His Ala
 49 125 130 135
 51 Ala Pro Gly Asp Ala Val Ala Glu Ile Asp Ala Leu Tyr Asp Val
 52 140 145 150
 54 Tyr Leu Asp Val Gln Glu Lys Trp Gly Leu Glu Asp Val Met Leu
 55 155 160 165
 57 Met Gly Asp Phe Asn Ala Gly Cys Ser Tyr Val Arg Trp Ser Gln
 58 170 175 180
 60 Trp Ser Ser Ile Arg Leu Trp Thr Ser Pro Thr Phe Gln Trp Leu
 61 185 190 195
 63 Ile Pro Asp Ser Ala Asp Thr Thr Ala Thr Trp Thr His Cys Ala
 64 200 205 210
 66 Tyr Asp Arg Ile Val Val Ala Gly Met Leu Leu Arg Gly Ala Val

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67          215          220          225
68 Val Pro Asp Ser Ala Leu Pro Phe Asn Phe Gln Ala Ala Tyr Gly
69          230          235          240
70 Leu Ser Asp Gln Leu Ala Gln Ala Ile Ser Asp His Tyr Pro Val
71          245          250          255
72 Glu Val Met Leu Lys
73          260
74 <210> SEQ ID NO: 2
75 <211> LENGTH: 260
76 <212> TYPE: PRF
77 <213> ORGANISM: Homo sapiens
78 <400> SEQUENCE: 2
79
80 Leu Lys Ile Ala Ala Phe Asn Ile Arg Thr Phe Gly Thr Thr Lys
81      1          5          10          15
82 Met Ser Asn Ala Thr Leu Val Ser Tyr Ile Val Gln Ile Leu Ser
83      20          25          30
84 Arg Tyr Asp Ile Ala Leu Val Gln Glu Val Arg Asp Ser His Leu
85      35          40          45
86 Thr Ala Val Gly Lys Leu Leu Asp Asn Leu Asn Gln Asp Ala Pro
87      50          55          60
88 Asp Thr Tyr His Tyr Val Val Ser Glu Pro Leu Gly Arg Asn Ser
89      65          70          75
90 Tyr Lys Glu Arg Tyr Leu Phe Val Tyr Arg Pro Asp Gln Val Ser
91      80          85          90
92 Ala Val Asp Ser Tyr Tyr Tyr Asp Asp Gly Cys Glu Pro Cys Gly
93      95          100          105
94 Asn Asp Thr Phe Asn Arg Gln Pro Ala Ile Val Arg Phe Phe Ser
95      110          115          120
96 Arg Phe Thr Gln Val Arg Gln Phe Ala Ile Val Pro Leu His Ala
97      125          130          135
98 Ala Pro Gly Asp Ala Val Ala Gln Ile Asp Ala Leu Tyr Asp Val
99      140          145          150
100 Tyr Leu Asp Val Gln Gln Lys Trp Gly Leu Glu Asp Val Met Leu
101      155          160          165
102 Met Gly Asp Phe Asn Ala Gly Cys Ser Tyr Val Arg Pro Ser Gln
103      170          175          180
104 Trp Ser Ser Ile Arg Leu Trp Thr Ser Pro Thr Phe Gln Trp Leu
105      185          190          195
106 Ile Pro Asp Ser Ala Asp Thr Thr Ala Thr Pro Thr His Cys Ala
107      200          205          210
108 Tyr Asp Arg Ile Val Val Ala Gly Met Leu Leu Arg Gly Ala Val
109      215          220          225
110 Val Pro Asp Ser Ala Leu Pro Phe Asn Phe Gln Ala Ala Tyr Gly
111      230          235          240
112 Leu Ser Asp Gln Leu Ala Gln Ala Ile Ser Asp His Tyr Pro Val
113      245          250          255
114 Glu Val Met Leu Lys
115      260
116 <210> SEQ ID NO: 3

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RAW SEQUENCE LISTING

PATENT APPLICATION: US/10/005,306

DATE: 8/31/2002

TIME: 11:52:51

Input Set : A:\P1042C1.txt

Output Set : N:\CRF3\05312002\J005306.raw

139 *211* LENGTH: 260

140 *212* TYPE: PRT

141 *213* ORGANISM: Homo sapiens

143 *400* SEQUENCE: 3

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144  Leu Lys Ile Ala Ala Phe Asn Ile Gln Thr Phe Gly Lys Thr Lys
145      1          5          10          15
147  Met Ser Asn Ala Thr Leu Val Ser Tyr Ile Val Gln Ile Leu Ser
148      20          25          30
150  Arg Tyr Asp Ile Ala Leu Val Thr Gln Val Arg Asp Ser His Leu
151      35          40          45
153  Thr Ala Val Gly Lys Leu Leu Asp Asn Leu Asn Gln Asp Ala Pro
154      50          55          60
156  Asp Thr Tyr His Tyr Val Val Ser Gln Pro Leu Gly Arg Asn Ser
157      65          70          75
159  Tyr Lys Gln Arg Tyr Leu Phe Val Tyr Arg Pro Asp Thr Val Ser
160      80          85          90
162  Ala Val Asp Ser Tyr Tyr Tyr Asp Asp Gly Cys Gln Pro Cys Gly
163      95          100          105
165  Asn Asp Thr Phe Asn Arg Gln Pro Ala Ile Val Arg Phe Phe Ser
166      110          115          120
168  Arg Phe Thr Gln Val Arg Gln Phe Ala Ile Val Pro Leu His Ala
169      125          130          135
171  Ala Pro Gly Asp Ala Val Ala Gln Ile Asp Ala Leu Tyr Asp Val
172      140          145          150
174  Tyr Leu Asp Val Gln Gln Lys Trp Gly Leu Gln Asp Val Met Leu
175      155          160          165
177  Met Gly Asp Phe Asn Ala Gly Cys Ser Tyr Val Arg Pro Ser Gln
178      170          175          180
180  Trp Ser Ser Ile Arg Leu Trp Thr Ser Pro Thr Phe Thr Trp Leu
181      185          190          195
183  Ile Pro Asp Ser Ala Asp Thr Thr Ala Thr Pro Thr His Cys Ala
184      200          205          210
186  Tyr Asp Arg Ile Val Val Ala Gly Met Leu Leu Arg Gly Ala Val
187      215          220          225
189  Val Pro Asp Ser Ala Leu Pro Phe Asn Phe Gln Ala Ala Tyr Gly
190      230          235          240
192  Leu Ser Asp Thr Leu Ala Thr Ala Ile Ser Asp His Tyr Trp Val
193      245          250          255
195  Gln Val Met Leu Lys
196      260

```

198 *2108* SEQ ID NO: 4

199 *2118* LENGTH: 260

200 *2128* TYPE: PRT

201 *2138* ORGANISM: Homo sapiens

203 *4008* SEQUENCE: 4

```

204  Leu Lys Ile Ala Ala Phe Asn Ile Gln Thr Phe Gly Arg Thr Lys
205      1          5          10          15
207  Met Ser Asn Ala Thr Leu Val Ser Tyr Ile Val Gln Ile Leu Ser
208      20          25          30

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RAW SEQUENCE LISTING

PATENT APPLICATION: US/10/005,306

DATE: 07/11/2002

TIME: 11:52:51

Input Set : A:\P1042C1.txt

Output Set : N:\CRF3\05312002\J005306.raw

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210 Arg Tyr Asp Ile Ala Leu Val His Glu Val Arg Asp Ser His Leu
211           38           40           42
213 Thr Ala Val Gly Lys Leu Leu Asp Asn Leu Asn His Asp Ala Pro
214           50           55           60
216 Asp Thr Tyr His Tyr Val Val Ser Glu Pro Leu Gly Arg Asn Ser
217           65           70           75
219 Tyr Lys Glu Arg Tyr Leu Phe Val Tyr Arg Pro Asp Gln Val Ser
220           80           85           90
222 Ala Val Asp Ser Tyr Tyr Tyr Asp Asp Gly Cys Glu Pro Cys Gly
223           95          100          105
225 Asn Asp Thr Phe Asn Arg Glu Pro Ala Ile Val Arg Phe Phe Ser
226          110          115          120
228 Arg Phe Thr Glu Val Arg Glu Phe Ala Ile Val Pro Leu His Ala
229          125          130          135
231 Ala Pro Gly Asp Ala Val Ala Glu Ile Asp Ala Leu Tyr Asp Val
232          140          145          150
234 Tyr Leu Asp Val Gln Glu Lys Trp Gly Leu Glu Asp Val Met Leu
235          155          160          165
237 Met Gly Asp Phe Asn Ala Gly Cys Ser Tyr Val Arg Pro Ser Gln
238          170          175          180
240 Trp Ser Ser Ile Arg Leu Trp Thr Ser Pro Thr Phe Gln Trp Leu
241          185          190          195
243 Ile Pro Asp Ser Ala Asp Thr Thr Ala Thr Pro Thr His Cys Ala
244          200          205          210
246 Tyr Asp Arg Ile Val Val Ala Gly Met Leu Leu Arg Gly Ala Val
247          215          220          225
249 Val Pro Asp Ser Ala Leu Pro Phe Asn Phe Gln Ala Ala Tyr Gly
250          230          235          240
252 Leu Ser Asp Gln Leu Ala His Ala Ile Ser Asp His Tyr Pro Val
253          245          250          255
255 Glu Val Met Leu Lys
256          260
258 <210> SEQ ID NO: 5
259 <211> LENGTH: 260
260 <212> TYPE: PR1
261 <213> ORGANISM: Homo sapiens
262 <4> SEQUENCE: 5
264 Leu Lys Ile Ala Ala Phe Asn Ile Val Thr Phe His His Lys Lys
265           1           5           10
267 Met Ser Asn Ala Thr Leu Val Ser Tyr Ile Val Gln Ile Leu Ser
268          20          25          30
270 Arg Tyr Asp Ile Ala Leu Val His Glu Val Arg Asp Ser His Leu
271          35          40          45
273 Thr Ala Val Gly Lys Leu Leu Asp Asn Leu Asn Glu Asp Ala Pro
274          50          55          60
276 Asp Thr Tyr His Tyr Val Val Ser Glu Pro Leu Gly Arg Asn Ser
277          65          70          75
279 Tyr Lys Glu Arg Tyr Leu Phe Val Tyr Arg Pro Asp Gln Val Ser
280          80          85          90

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RAW SEQUENCE LISTING

PATENT APPLICATION NO: US/10/005,306

DATE: 05/31/2002

TIME: 11:52:11

Input Set: A:\P1042C1.txt

Output Set: N:\CRF3\05312002\J005306.raw

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282 Ala Val Asp Ser 171 171 171 Asp Asp Gly Cys His Pro Tyr Tyr
283 174 174 174 174 174 174
285 Asn Asp Thr Phe Asn Arg Glu Pro Ala Ile Val Arg Phe Phe Ser
286 119 119 119 119 119 119
288 Arg Phe Thr Glu Val Arg Glu Phe Ala Ile Val Pro Leu His Ala
289 125 125 125 125 125 125
291 Ala Pro Gly Asp Ala Val Ala Glu Ile Asp Ala Leu Tyr Asp Val
292 140 140 140 140 140 140
294 Tyr Leu Asp Val Thr Thr Lys Trp Gly Leu Glu Asp Val Met Leu
295 155 155 155 155 155 155
297 Met Gly Asp Phe Asn Ala Gly Cys Ser Tyr Val Arg Pro Ser Gln
298 170 170 170 170 170 170
300 Trp Ser Ser Ile Arg Leu Trp Thr Ser Pro Thr Phe Gln Trp Leu
301 185 185 185 185 185 185
303 Ile Pro Asp Ser Ala Asp Thr Thr Ala Thr Pro Thr His Cys Ala
304 200 200 200 200 200 200
306 Tyr Asp Arg Ile Val Val Ala Gly Met Leu Leu Arg Gly Ala Val
307 215 215 215 215 215 215
309 Val Pro Asp Ser Ala Leu Pro Phe Asn Phe Gln Ala Ala Tyr Gly
310 230 230 230 230 230 230
312 Leu Ser Asp Gln Leu Ala Gln Ala Ile Ser Asp His Tyr Pro Val
313 245 245 245 245 245 245
315 Glu Val Met Leu Lys
316 260
318 <210> SEQ ID NO: 6
319 <211> LENGTH: 260
320 <212> TYPE: PRT
321 <213> ORGANISM: Homo sapiens
323 <100> SEQUENCE: 6
324 Leu Lys Ile Ala Ala Phe Asn Ile Gln Thr Phe Gly Gln Arg Lys
325 1 5 10 15
327 Met Ser Asn Ala Thr Leu Val Ser Tyr Ile Val Gln Ile Leu Ser
328 20 25 30
330 Arg Tyr Asp Ile Ala Leu Val Gln Glu Val Arg Asp Ser His Leu
331 35 40 45
333 Thr Ala Val Gly Lys Leu Leu Asp Asn Leu Asn Gln Asp Ala Pro
334 50 55 60
336 Asp Thr Tyr His Thr Val Val Ser Thr Pro Leu Gly Arg Asn Ser
337 65 70 75
339 Tyr Lys Glu Arg Tyr Leu Phe Val Tyr Arg Pro Asp Gln Val Ser
340 80 85 90
342 Ala Val Asp Ser Tyr Tyr Tyr Asp Asp Gly Cys Gln Pro Cys Gly
343 95 100 105
345 Asn Asp Thr Phe Asn Arg Glu Pro Ala Ile Val Arg Phe Phe Ser
346 110 115 120
348 Arg Phe Thr Glu Val Arg Glu Phe Ala Ile Val Pro Leu His Ala
349 125 130 135
351 Ala Pro Gly Asp Ala Val Ala Thr Ile Asp Ala Leu Tyr Asp Val
352 140 145 150

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VERIFICATION SUMMARY

DATE: 05/31/2002
TIME: 11:52:02
PATH: N:\US\10\005,306

DATE: 05/31/2002

TIME: 11:52:02

Input Set : A:\P1042C1.txt

Output Set : N:\CRF3\05312002\J005306.raw

Full Model to Current Filling Date History Exploded Current Filling Date